

**Amendments to the Drawings:**

The attached sheet of drawings relabels the “**Fig. 2,**” which was submitted in the Responsive Amendment filed August 10, 2004, as **Fig. 3**. The “**Fig. 2**” submitted on August 10, 2004, was improperly labeled because a **Fig. 2** had been submitted previously. This sheet, which includes relabeled **Fig. 3**, replaces the previously submitted sheet including improperly labeled “**Fig. 2.**”

Attachment: Replacement Sheet

Annotated Sheet Showing Changes (changes shown in red ink)

**Request for Reconsideration:**

Applicants are amending Para. [0012.2] and [0014] to replace certain references to **Fig. 2** with references to **Fig. 3**. Further, Applicants are replacing the improperly labeled **Fig. 2** submitted in the Responsive Amendment filed on August 10, 2004. Applicants also are amending claim 1 to clarify the description of the invention and claim 4 to depend from amended claim 1. Applicants also are cancelling claims 13-36, without prejudice. The canceled claims are directed to an unelected invention. No new matter is added by the foregoing amendments, and these amendments are fully supported by the specification. E.g., Appl'n, Paras. [0001], [0007], [0016], and [0017]. Applicants respectfully request that the Examiner enter the foregoing amendments and reconsider the above-captioned patent application in view of the foregoing amendments and the following remarks.

**Remarks:**

1. Objections and Rejections.

The Office Action objects to the drawings and the specification alleging that Applicants improperly labeled the figure submitted in the Responsive Amendment filed August 10, 2004. In view of the foregoing amendments, Applicants respectfully traverse these objections and respectfully request that the Examiner withdraw these objections.

In view of Applicants' earlier amendments and remarks, the Examiner has withdrawn the rejections of claims 1, 2, and 5-7 under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 3,590,917 to Huber et al. ("Huber"). Nevertheless, claims 1, 2, and 4-7 still stand rejected under 35 U.S.C. § 103(a), as allegedly rendered obvious by U.S. Patent No. 5,800,673 to Okuda et al. ("Okuda") in view of Huber. Moreover, claims 8 and 9 now stand rejected under 35 U.S.C. § 103(a), as allegedly rendered obvious by Okuda in view of Huber, as applied to claim 1, and further in view of U.S. Patent No. 4,428,418 to Beasley; and claim 10 now stands rejected under 35 U.S.C. § 103(a), as allegedly rendered obvious by Okuda in view of Huber, as applied to claim 1, and further in view of U.S. Patent No. 4,804,713 to Akiyama. The Office Action has made these rejections **final**. Applicants respectfully traverse.

2. Obviousness Rejections.

As noted above, claims 1, 2, and 4-7 stand rejected as allegedly rendered obvious by Okuda in view of Huber; claims 8 and 9 stand rejected as allegedly rendered obvious by Okuda in view of Huber, as applied to claim 1, and further in view of Beasley; and claim 10

stands rejected as allegedly rendered obvious by Okuda in view of Huber, as applied to claim 1, and further in view of Akiyama. In order for the Office Action to establish a prima facie case of obviousness, at least three criteria must be met. First, there must be some suggestion or motivation, either in the combined references or in the knowledge generally available to one of ordinary skill in the art, to combine the cited references in the manner proposed by the Office Action. Second, the prior art references must disclose or suggest all the claim limitations. Third, there must be a reasonable expectation of success. MPEP 2143. For the reasons set forth below, Applicants respectfully traverse these obviousness rejections.

a. Claims 1, 2, and 4-7.

As noted above, the Office Action rejects claims 1, 2, and 4-7 as allegedly rendered obvious by Okuda in view of Huber. Applicants respectfully disagree. Specifically, claim 1, as amended, describes a heat exchanger comprising “a first aluminum member, all surfaces of which are coated with a first portion of a resin, and a second aluminum member, all surfaces of which are coated with a second portion of said resin, wherein said first aluminum member is fixed to said second aluminum member via said first portion of said resin and said second portion of said resin, and wherein said first aluminum member is separated from said second aluminum member by said first portion of said resin and said second portion of said resin.” (Emphasis added.) As such, the resin both fixes the aluminum members to each other and separates the aluminum members from each other. In addition, the resin coats all surfaces of each of the first and second aluminum members. E.g., Appl’n, Paras. [0001] and [0007].

(i) No Teaching to Cover All Surfaces of Aluminum Members With Resin.

In response to the previous anticipation rejections of claim 1 based on Okuda, Applicants noted that Okuda fails to disclose or suggest that the first aluminum member is fixed to the second aluminum member via the resin. Okuda describes a heat exchanger including a plurality of tubular elements 1. Tubular elements 1 are fixed to each other by “arranging two dish-like core plates 6 into an inside-to-inside relation and subsequently brazing them at their peripheries 6a to be integral with each other.” Okuda, Column 8, Lines 53-56 (emphasis added). Specifically, a “brazing agent layer is applied by a cladding technique so that the core plates 6 are easily brazed together.” Id. at Column 8, Lines 59-61. Each core plates 6 includes a rib 7, and “a plurality of straight drainage canals 7a are defined by the inwardly protruding recessed

ribs 7.” Id. at Column 10, Lines 20-21. Moreover, “in order to improve the drainage of condensed water, it is desirable and effective that the straight canals 7a are covered with a resin coating (S).” Id. at Column 10, Lines 21-24. As such, the purpose of the resin coating (S) applied to straight drainage canals described in Okuda is to increase drainage. The resin coating (S) also may be applied to the surfaces of tubular elements 1. The heat exchanger is assembled by brazing, then submerged in the resin (S), and then subjected to a baking process. Id. at Column 13, Lines 43-57.

Huber describes the application of resin to the “contacting or closest approach regions of the plates, e.g., at the periphery or the undulations thereof.” Huber, Column 1, Lines 61-65; see also Huber, Column 2, Lines 63-75, and Column 3, Lines 1-5; Column 6, Lines 10-13. Thus Applicants maintain that Huber does not supply this missing element of amended claim 1.

(ii) Okuda and Huber Teach the Use of Different Resins.

In addition, Okuda describes the application of a hydrophilic resin to some portions of the plate surfaces and the exclusion of such resin from other surfaces, in particular, the exclusion of resin from surfaces to be soldered. E.g., Okuda, Abstract; Column 13, Lines 43-57; **Fig. 5**. Moreover, Okuda states that

the hydrophilic resin coating employed herein to seal the outer surfaces of each tubular element and each fin is required to comprise . . . polyvinyl alcohol resin as its main component, polyamide and/or polyvinyl pyrrolidone resins as its hydrophilic agent blended with the main component. In addition to them, the resin coating should further contain a film hardener contained at a concentration sufficient to harden the resin coating but not so excessively as to react with the hydrophilic groups in molecules of the resin and impair its hydrophilic property, and a surfactant for stabilizing the bath of a resin composition so as not to bubble.

Okuda, Column 6, Lines 16-27 (emphasis added). Thus, Okuda describes its resin coating in specific detail.

The Advisory Action contends that Applicants have misunderstood the Office Action’s rejections based on Okuda in view of Huber. The Advisory Action explains that it “does not rely on Huber to replace Okuda’s resin with an adhesive resin,” but alleges instead that the Huber “teaches the use of adhesive resin to replace other bonding means such as soldering

(brazing).” Advisory Action, Item 11, Lines 2-4. The Advisory Action does not contend that the thermosetting resins used by Huber are suitable for the hydrophilic purposes described by Okuda, and the Advisory Action does not argue that Huber’s resin could replace Okuda’s resin. *Id.* at Lines 5-7.

Nevertheless, Okuda has “required” the inclusion of certain components in its hydrophilic resin, and the Office Action has failed to demonstrate that those components are present in Huber’s resins. Okuda, Column 6, Lines 16-21. As noted above, Okuda requires the presence of polyvinyl alcohol as the “main component” of its resin. Polyvinyl alcohol resin is not a thermosetting resin.<sup>2</sup> Thermosetting resins may form durable, highly-crosslinked structures upon hardening, such as that formed by the epoxy resins described in Huber. In contrast, polyvinyl alcohol resins tend to form thermoplastic resins. A thermoplastic resin is not crosslinked to any significant extent, if at all. Further, thermoplastic resins, such as polyvinyl alcohol resins, tend to comprise long strands of polymers. When heated, these strands of polymers readily move past one another, making the resin plastic. Although some polyvinyl alcohol resins are not considered thermoplastic, that is because they have degradation temperatures lower than their melting points. Neither thermoplastic nor thermal-degradable polyvinyl alcohol resins, however, are thermosetting.

Both thermoplasticity and thermal degradation are at odds with the structural properties required for Huber’s synthetic resins. Huber’s resins require sufficient mechanical strength and structural stability to hold parts together. Highly crosslinked thermosetting resins, such as epoxies, are well suited for that purpose. In addition, thermosetting resins generally retain their mechanical properties well at elevated temperatures. In contrast, polyvinyl alcohol resins generally are unsuitable for use as structural components because such resins generally lack mechanical strength. This is particularly true at higher temperatures, at which such resins may become more plastic or even degrade. Plasticity or chemical breakdown render polyvinyl alcohol resins still more pliable, and, thus, even more unsuitable to the purposes described by Huber.

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<sup>2</sup> In claims 5 and 6, respectively, Applicants state that the first and second portions of the resin may be a thermoplastic resin or a thermosetting resin. Nevertheless, Applicants do not claim the use of polyvinyl alcohol resins.

(iii) No Motivation to Coat All Surfaces With A Resin.

Nevertheless, as Applicants previously have remarked, “[i]f the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified[, i.e., Okuda’s invention], then the teachings of the references are not sufficient to render the claims prima facie obvious.” MPEP 2143.01 pg 2100-132 (8th ed., Rev. 2, May 2004)(emphasis added). As amended, Applicants’ claim 1 clearly describes the coating of all surfaces of the aluminum members with a resin. Because of the differences in the properties of the hydrophilic resins required by Okuda and the adhesive resins required by Huber, the Office Action’s combination of the teachings of these references would require the use of different resins on different surfaces. E.g., Okuda, Abstract; Column 13, Lines 43-57; **Fig. 5**. This is contrary to the description of claim 1, as amended.

In addition, the Office Action relies on “lowering the cost of the heat exchanger and decreasing the defect rate of the heat exchanger plate joints,” as the motivation to modify Okuda in view of Huber. Applicants maintain, however, that the Office Action has not demonstrated that either motivation is satisfied if the combination of references teaches coating the heat exchanger members with two different resins. Advisory Action, Item 11, Lines 4-5. Therefore, Applicants maintain that the Office Action fails to demonstrate a motivation to modify the primary reference to include the limitations of the secondary reference. Although the Office Action alleges that “the resin material of Huber et al. is similar to the claimed resin,” this is not sufficient to justify the modification of Okuda in view of Huber and does not establish a *prima facie* case of obviousness with respect to claim 1, as amended. Office Action, Page 5, Lines 4-5.

In summary, the polyvinyl alcohol resins of Okuda are very different from the adhesive resins described in Huber. Therefore, Applicants maintain that the Office Action fails to demonstrate a motivation or suggestion to combine the teachings of Okuda and Huber to achieve the invention of Applicants’ claim 1, as amended. Moreover, modifying Okuda to replace its polyvinyl alcohol resins with the thermosetting resins described in Huber would change the principle of Okuda’s operation and/or render Okuda unsuitable for its intended purpose, contrary to MPEP 2143.01. Therefore, Applicants maintain that the Office Action fails

to demonstrate that the combination of Okuda with Huber establishes a *prima facie* case of obviousness with respect to amended claim 1.

Claims 2 and 4-7 depend from claim 1. “If an independent claim is non-obvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.” MPEP 2143.03 pg 2100-133 (8th ed., Rev. 2, May 2004)(citations omitted). Therefore, in view of the foregoing remarks concerning the obviousness rejection to claim 1, Applicants maintain that the rejections to claims 2 and 4-7 are untenable and respectfully request that the Examiner withdraw the obviousness rejection of claims 2 and 4-7.

b. Claims 8-10.

Each of claims 8-10 depends directly from amended claim 1 and further limits the description of claim 1 by identifying a particular type of resin coated on all member surfaces. Because Huber focuses on thermosetting resins, or at the very least requires a resin able to perform structural functions; a nylon resin (claim 9) or a vinylidene fluoride resin (claim 10) would not be suitable for use in the invention of Huber. Both of these types of resins generally are thermoplastic, rather than thermosetting. Thus, in view of the teachings of Huber, the Office Action fails to demonstrate that a person skilled in the art would expect either of these resins to function well for any structural purpose. Further, in view of the requirements of MPEP 2143.01, Applicants maintain that the Office Action fails to demonstrate that either resin of claim 9 or 10 meets Okuda’s requirements for a suitable hydrophilic resin, especially, that suitable resins contain polyvinyl alcohol as the “main component.”

After reviewing Huber, Applicants have found nothing in Huber that would prevent the modification of Huber to use a polyester resin (claim 8), so long as it is a thermosetting form of polyester and not a thermoplastic form, as Huber’s adhesive. Nevertheless, as noted above, the Office Action fails to demonstrate that any of the resins of claims 8-10, when coated on all surfaces of the aluminum member, fulfills Okuda’s requirements for a hydrophilic resin. Further, the Office Action fails to demonstrate that the polyester resin suggested by the cited references contains (or should be modified to contain) polyvinyl alcohol as the “main component.” Thus, the proposed modification to Okuda to include the use of the resins taught by these references is improper. MPEP 2143.01. Therefore, to the extent that neither Okuda in view of Huber alone or in combination with the teachings of Beasley or

Akiyama or discloses (or suggests) each and every one of the elements of amended claim 1, the Office Action fails to demonstrate a *prima facie* case of obviousness with respect to claims 8-10. MPEP 2143.03.

**Conclusion and Request for Interview:**

Applicants respectfully submit that this application, as amended, is in condition for allowance, and such disposition is earnestly solicited. Nevertheless, Applicants respectfully request an interview with the Examiner, either in person or by telephone, prior to the issuance of a first Office Action on the merits in this application.

Respectfully submitted,

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Dated: March 9, 2005

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Enclosures





Appl'n No. 10/053,582  
Amd't Dated Mar. 9, 2005  
Reply to Office Action of Dec. 9, 2004  
Annotated Sheet Showing Changes

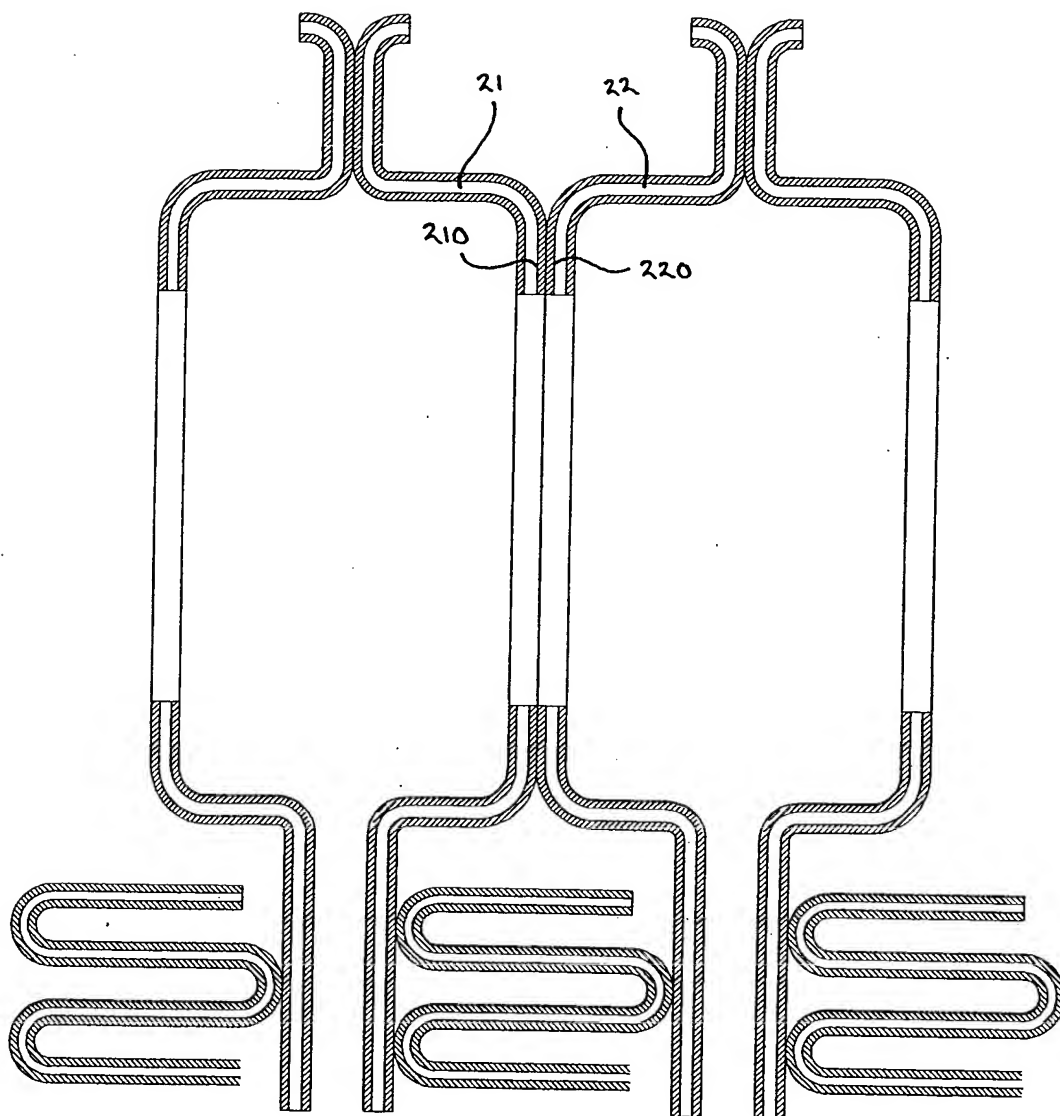


Fig. 3

← RENUMBER  
FIG. 2 SUBMITTED  
08/10/04, AS FIG. 3